

Report Documentation Page			Form Approved OMB No. 0704-0188		
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1. REPORT DATE 30 SEP 2009		2. REPORT TYPE Annual		3. DATES COVERED 00-00-2009 to 00-00-2009	
4. TITLE AND SUBTITLE Profiling Dissipation Measurements Using Xpods On Moored Profilers In Luzon Strait			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Oregon State University, College of Oceanic & Atmospheric Sciences, Corvallis, OR, 97331			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Code 1 only					
14. ABSTRACT The long-term goal of this program is to understand the physics of small-scale oceanic processes and how they affect the larger scales of ocean circulation. Ongoing studies within the Ocean Mixing Group at OSU emphasize observations, interaction with turbulence modelers and an aggressive program of sensor / instrumentation development and integration.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 2	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Profiling Dissipation Measurements using χ pods on Moored Profilers in Luzon Strait

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Award #: N00014-09-1-0280

LONG-TERM GOALS

The long-term goal of this program is to understand the physics of small-scale oceanic processes and how they affect the larger scales of ocean circulation. Ongoing studies within the **Ocean Mixing Group** at OSU emphasize observations, interaction with turbulence modelers and an aggressive program of sensor / instrumentation development and integration.

OBJECTIVES

The principal objectives of this project are to:

- quantify the energy losses to turbulent dissipation in the Luzon Strait in a systematic, comprehensive and extended way;
- quantify the spring-neap variation in these energy losses;
- obtain meaningful, long-term observations of the turbulent heat and momentum flux profiles in Luzon Strait, from which useful parameterizations can be derived;
- measure the seafloor pressure difference through the Strait associated with deepwater overflows.

APPROACH

To accomplish these objectives, we will:

1. modify 1-2 McLane Moored Profilers MPs for direct and extended measurements of turbulence,
2. build additional fixed-point turbulence measurements to add to the MP moorings, and
3. contribute high-resolution seafloor pressure sensors for mooring-of-opportunity deployments.

WORK COMPLETED

This project has just begun. Working together with engineers from the Applied Physics Lab at University of Washington, we are in the process of completing detailed engineering drawings of modifications to the MP and of new pressure cases required to house analog electronics, sensors, analog-to-digital conversion electronics and batteries.

Initial engineering tests are scheduled for December 2009 in Puget Sound. These tests will be conducted in coordination with an independent study on the form drag over Three Tree Point south of Seattle.

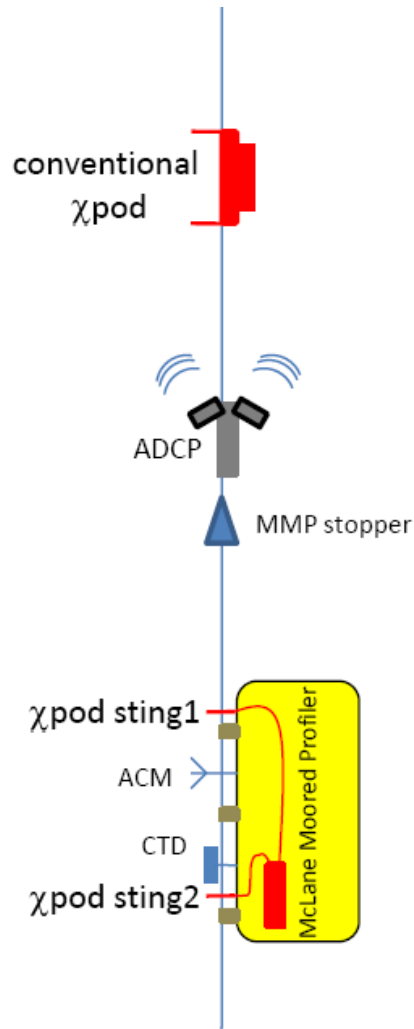


Figure 1 – schematic of turbulence-resolving χ pods on one (of 2) Moored Profilers. Additional χ pods will be deployed above the upper stopper (50 m, shown) and below the bottom stopper (1500 m, not shown). These provide continuous time series at 50 and 1500 m to complement continuous profiles through the water column. ADCPs will be deployed nearby to measure flow speed variations at upper / lower χ pods.